

What is claimed is:

1. An implantable medical device for the treatment of cancer comprising:

a hermetically sealed device housing;

5 a battery contained within said hermetically sealed device housing;

circuitry contained within said hermetically sealed device housing wherein said circuitry is coupled to said battery; and

10 at least one electrode operably coupled to said circuitry wherein said circuitry delivers direct current electrical therapy to said at least one electrode continuously for a period of time not less than 1 minute for the treatment of cancerous tumors.

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2. The device of claim 1 wherein said direct current electrical therapy involves the use of multiple voltages.

3. The device of claim 1 wherein said direct current
20 electrical therapy is applied at a voltage for a time period of between 1 minute and 1 day.

4. The device of claim 1 wherein said direct current
25 electrical therapy is applied at a voltage for a time period of between 1 hour and 1 week.

5. The device of claim 1 wherein said direct current
electrical therapy is applied at a voltage for a time
period of between 1 and 120 minutes.

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6. The device of claim 1 wherein said device monitors at least one voltage from within tissue.

7. The device of claim 6 wherein said direct current electrical therapy is adjusted according to the sensed tissue voltage.

5 8. The device of claim 7 wherein said direct current electrical therapy is applied for a time period between 1 hour and 1 month.

10 9. The device of claim 1 wherein said direct current electrical therapy alternates between positive and negative voltages.

15 10. The device of claim 1 further comprising an electrical port contact coupled to said device in order to receive externally generated electrical therapies.

11. A method of treating cancerous tumors comprising the steps of:

20 implanting at least one catheter into a tumor;
 implanting a source of chemotherapeutic drug;
 connecting said catheter to said source of chemotherapeutic drug; and

 delivering said chemotherapeutic drug into said tumor from said source of chemotherapeutic drug.

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12. The method of claim 11 further comprising the additional step of synchronizing delivery of said chemotherapeutic drug to a circadian rhythm.

30 13. The method of claim 11 wherein said step of delivering of the chemotherapeutic drug is performed through the use of a catheter with fixation means.

14. A method of treating cancerous tumors comprising the steps of:

5 implanting at least one catheter adjacent to said tumor;

 implanting a source of chemotherapeutic drug;

 connecting said catheter to said source of chemotherapeutic drug; and

10 delivering said chemotherapeutic drug into said tumor from said source of chemotherapeutic drug.

15 15. The method of claim 14 further comprising the additional step of synchronizing delivery of said chemotherapeutic drug to a circadian rhythm.

16. The method of claim 14 wherein said step of delivering of the chemotherapeutic drug is performed through the use of a catheter with fixation means.

20 17. An implantable medical device for the treatment of cancer comprising:

 a device housing;

 a battery contained within said device housing;

 circuitry contained within said device housing

25 wherein said circuitry is coupled to said battery; and

 at least one electrode operably coupled to said circuitry wherein said circuitry delivers direct current electrical therapy to said at least one electrode continuously for a period of time not less than 1 minute
30 for the treatment of cancerous tumors.

18. The device of claim 17 wherein said direct current electrical therapy involves the use of multiple voltages.

5 19. The device of claim 17 wherein said direct current electrical therapy is applied at a voltage between 1 volt and 20 volts.

10 20. The device of claim 17 wherein said direct current electrical therapy is applied at a voltage for a time period of between 1 minute and 1 day.

15 21. The device of claim 17 wherein said direct current electrical therapy is applied at voltages and time periods sufficient for changing the pH by at least 2.0 inside said tumor.

20 22. The device of claim 17 wherein said direct current electrical therapy is applied at a voltage between 20mV and 500mV.

25 23. The device of claim 17 wherein said direct current electrical therapy is applied at a voltage for a time period of between 1 hour and 1 week.

24. The device of claim 17 wherein said direct current electrical therapy is applied at voltages and time periods sufficient to attract white blood cells.

30 25. The device of claim 17 wherein said direct current electrical therapy is applied at a voltage between 100mV and 10 volts.

26. The device of claim 17 wherein said direct current electrical therapy is applied at a voltage for a time period of between 1 and 120 minutes.

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27. The device of claim 17 wherein said direct current electrical therapy is applied as a series of voltage pulses between 20 and 900 volts.

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28. The device of claim 17 wherein said direct current electrical therapy is applied as a series of voltage pulses wherein said voltage pulses have a pulse width of between 100 μ s and 20 ms.

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29. The device of claim 17 wherein said direct current electrical therapy is applied as a series of voltage pulses wherein said voltage pulses have a spacing period of between 100 μ s and 1 second.

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30. The device of claim 29 wherein said voltage pulses number between 1 and 10,000.

31. The device of claim 17 wherein said direct current electrical therapy is applied at voltages and pulse widths sufficient to force open tumor cell membranes.

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32. The device of claim 17 wherein said device monitors at least one voltage from within tissue.

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33. The device of claim 32 wherein said direct current electrical therapy is adjusted according to the sensed tissue voltage.

34. The device of claim 33 wherein said direct current electrical therapy is applied at voltages between 20mV and 500mV.

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35. The device of claim 34 wherein said direct current electrical therapy is applied for a time period between 1 hour and 1 month.

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36. The device of claim 17 wherein said direct current electrical therapy alternates between positive and negative voltages.

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37. The device of claim 17 further comprising an electrical port contact coupled to said device in order to receive externally generated electrical therapies.

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38. The device of claim 17 further comprising any of the group consisting of a drug reservoir, a drug pump, a communication means to synchronize said direct current electrical therapy with a drug delivery system, and circuitry to alternate output polarities to reduce levels of electrode corrosion and degradation.